

REMARKS

In response to the Office Action dated 10 August 2007, claims 10 and 12 have been canceled without prejudice or disclaimer and claims 8-9, 13 and 15-18 have been amended. No new matter has been added. Reexamination and reconsideration of the claims as requested is respectfully requested.

In paragraph 4 on page 3 of the Office Action, claims 9-10, 12 and 15-17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 0989311 in view of Miki et al. (US Patent No. 3992974). The Applicants respectfully traverse this rejection, but have amended the application to overcome the objections.

In paragraph 5 on page 5 of the Office Action, claims 8 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 0989311 in view of Miki et al. (US Patent No. 3992974) and in further view of Hsiao (US Patent No. 6302629). The Applicants respectfully traverse this rejection, but have amended the application to overcome the objections.

In paragraph 6 on page 6 of the Office Action, claim 18 is rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 0989311 in view of Miki et al. (US Patent No. 3992974) and in further view of Wagner (US Patent No. 4193434). The Applicants respectfully traverse this rejection, but have amended the application to overcome the objections.

In paragraph 7 on page 7 of the Office Action, claim 14 is rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 0989311 in view of Miki et al. (US Patent No. 3992974) and in further view of Wagner (US Patent No. 4193434) and in even further view of Hsiao (US Patent No. 6302629). The Applicants respectfully traverse this rejection.

The screw as defined in claim 14 provides superior properties in a special application, wherein a screw is required which significantly facilitates the mounting

procedure without sacrificing anti-loosening properties in a low-stress application as present in soft counter-faces like alumina or the like, withstands fatigue loads over long time without the risk of failure and ensures electrical contact between the screw and the counter-face.

This is achieved by a screw having specific properties:

- i) A spring element is provided which is integral with the screw,
- ii) a plurality of openings are distributed uniformly over the periphery of the ring, constituting the spring element,
- iii) the spring element is of lower hardness than the screw element, and
- iv) the spring element has projections in the region of the work-piece contact.

The specific teaching of the four prior art documents is disregarded in making this applying the proposed sec. 103 combination, and indeed, they references partially contradict each other in important features which would not allow the skilled person to combine those teachings as referenced by the Examiner. In detail:

- i) The Miki-reference explicitly addresses a conical washer for a high tensile strength bolt. In contrast, the invention aims to provide a screw which is suitable in contact with soft counter-faces and in such applications there is no need for a high tensile strength bolt. Thus, the skilled person would not consider a specific teaching for a washer which is made for high strength bolts for an improvement relating to a screw for use in contact with soft counter-faces. This is a fundamental flaw in applying Miki. It is a teaching away from the proposed combination.
- ii) Further, Miki discloses a single washer which is not integral with a screw. Miki teaches to produce the washers from machine constructional carbon steel JIS S45C. This material is *not suitable for screws* and thus, Miki gives the teaching that washers having a Rockwell hardness of below HRC40 must be single

elements made of a specific steel not well suited for screws. In contrast, the screw as claimed comprises a spring element being integral with the screw.

- iii) Still further, it is claimed that the spring element is of lower hardness than the screw element. Miki does not give any teaching as to the relation of the spring element (i.e. the washer) and the screw element and thus completely fails to make obvious this specific relationship.
- iv) Finally, Miki does not address any *anti-loosening effect* by the deformation of the washer, as claimed. The skilled person extracts from Miki, that such plastic deformation of the washer may serve to precisely control axial bolt force but is **not** suited to prevent loosening as claimed. That last step is pure unsupported conjecture.
- v) Wagner discloses a single washer either. The washer is shown to have a plurality of openings. Whereas the Wagner-reference is insofar corresponding to the invention as claimed that it addresses the problem of securing an upper, plastic-like work-piece and minimizing cold flow, this teaching is absolutely contrary to the Miki-reference which addresses high tensile strength bolt connections and particular problems present in such connections like assuring precise bolt axial force in the course of tightening the screw. This is *not a problem which plays any role in screw connections against plastic-like work-pieces* or soft counter-faces like alumina. Thus, the skilled person will never combine openings as disclosed in the Wagner-reference for a washer constructed for contact against plastic-like work-pieces with the teaching of Miki showing a washer for a high tensile strength bolt.
- vi) Still further, the Hsiao-reference is applied in this complex web of references. This reference discloses a metal screw having a stiff ring beneath the screw head whereby on the bottom side of the stiff ring a plurality of relatively small integral tapered angle blocks are provided. Hsiao explicitly teaches to provide these tapered angle blocks to prevent loosening of a screw connection established with such screw. However, this is a contrary teaching to all other prior art references

cited by the Examiner. EP 0 989 311 A1 and Hsiao explicitly teach a washer which prevents anti-loosening by preserving the pre-stress of the screw connection via elastic deformation of the washer. Miki teaches plastic deformation of the washer without addressing any anti-loosening effect at all. The skilled person will not combine references which follow a completely different principle to prevent anti-loosening or references which do not address anti-loosening effects at all with each other. Thus, the skilled person will never combine Hsiao with any of the other references and will further not combine Miki with any of the other references.

- vii) Still further, the ring shown in the Hsiao-reference is completely different to the washers shown in the other three prior art references and the spring element according to the invention. To provide the effects aimed at in the Hsiao-reference, the ring must be particularly stiff and should not deform at all in order to bring the tapered angle blocks in strong contact with the counter-face. However, all other three prior art references disclose washers which functionally deform in the course of tightening the screw connection as does the spring element according to the invention. Thus, the skilled person will not combine the Hsiao-reference with any of the prior art references.
- vii) Still further, the Hsiao-reference discloses integral tapered angle blocks on the underside of the head of the screw, which are designed to dig into the counter-face. To achieve such digging-in, the hardness of the tapered angle blocks must be particularly high. Since the tapered angle blocks are integral with the head or, more specifically, integral with the stiff ring provided on the underside of the head, these tapered angle blocks will have the same hardness like said ring. The ring constituting the spring element in the screw according to the invention, however, is of lower hardness than the screw element. Thus, the skilled person will never combine a teaching like Hsiao requiring a ring of particularly high hardness with a washer having lower hardness than the screw element as claimed or with a washer according to the Miki-reference.

- viii) Still further, when aiming to provide safe digging-in of tapered angle blocks as disclosed in Hsiao, the skilled person will never provide openings in the washer as shown in Wagner and as claimed. Such openings will decrease the stiffness of the ring and thus will not allow such digging-in action of the tapered angle blocks.

Claim 14 is rejected based on a combination of EP 0 989 311 A1, Miki, Wagner and Hsiao. It is respectfully submitted that the rejection is based on a piecemeal extraction of elements of 4 disparate disclosure which have pieced together in an arbitrary puzzle-like combination with hindsight construct something like a screw as claimed.

We have submitted strong factual arguments as to why there would be no motivation by a person skilled in this art to combine the references. To do so the skilled person would have to disregard his/her skills.

Thus the only way to achieve this combination is to know the outcome first and then piece the prior art together with hindsight of the inventive concepts. This is an impermissible combination and use of the prior art. There mere statistical randomness of the combination of 4 references suggests that knowing the outcome (invention) would be essential to seeing the combination.

There is no assertion (supported or unsupported) that it would be "obvious to try" a combination of 4 references. There is no assertion (supported or unsupported) that this is a mere substitution of elements and *further*, that such substitution would be predictable. There is certainly no evidence in the examiner's argument that there were market forces or design incentives that have recently arisen to motivate the combination at this time, and predictably.

Finally, the combination utterly fails the teaching, motivation, suggestion (TSM) test, which the Supreme Court has indicated remains on of several valid test of obviousness.

In fact, the Graham v. John Deer factors are fully applicable in this case. The problem described and solved by the present invention has existed for a very long time (Long felt but unresolved need) and that the technology to solve it could have been

combined by others, indeed, the 4 cited references, but they didn't see the such a combination. That is strong indicia of that only hindsight makes the combination possible. The Supreme Court in Graham v. Deer (Graham v. John Deere Co., 383 U.S. at 17, 148 USPQ at 467), via the so-called Graham factors, has made it clear, the Patent Office must consider such secondary indicia as a source of guidance where there is dispute over obvious based on combinations of prior art.

The above arguments are fully consistent with the Supreme Court decision in KSR v. Teleflex. (**KSR v. Teleflex**, **550 U.S.**, 127 S. Ct. 1727 (2007)),.

Each of these tests, including TSM, appears in the Patent Office's own guidelines to determining obviousness after KSR. (PTO Docket no: PTO-P-2007-0031, also at **72 Fed. Reg. 57526**) In that guideline document, the Office repeats 15 times, the necessity of the examiner to make factual inquiry into the Graham factors. Clearly the Office recognizes the risk of using hindsight to make it appear that disparate combinations of reference can be made to look obvious, but the fact remains: why did the prior art creators see the same thing? We submit, because they didn't see the – invention.

CONCLUSION

In view of the amendments and reasons provided above, it is believed that all pending claims are in condition for allowance. The amendments clarify the patentable invention without adding new subject matter. Applicant respectfully requests favorable reconsideration and early allowance of all pending claims.

If a telephone conference would be helpful in resolving any issues concerning this communication, please contact Applicant's attorney of record, Michael B. Lasky at (952) 253-4106.

Respectfully submitted,
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Date: February 11, 2008

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